**Quadratics –Key Concepts Practice**

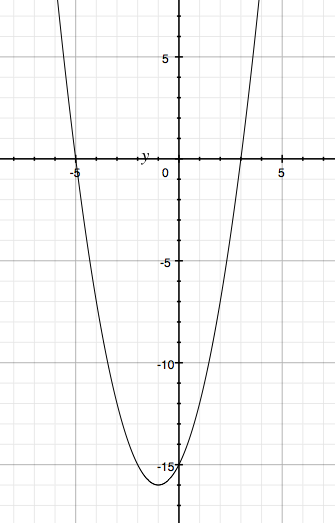
**The Basics/Key Concepts:**

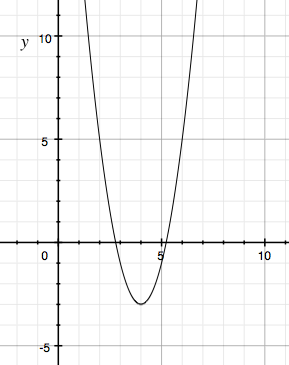
1.  is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form.  is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form.
2. If the *a*-value is positive, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the vertex is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If the *a*-value is negative, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the vertex is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. If  the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If  the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. The *h* value moves the parabola \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. The *k* value moves the parabola \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. The formula is used to find the \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a quadratic written in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form. You then plug this x-value back into the equation to find the y-value of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. I can just pick out the point (\_\_\_\_\_\_, \_\_\_\_\_\_) to find the vertex of a parabola written in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form.
8. The formula  is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ formula and is used to find the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a graph.
9. Solutions are also called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These points always occur where y=\_\_\_\_\_\_\_\_.
10. Factoring and then using the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ property is another way to find the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a quadratic.
11. Sketch the graph of a quadratic function that has

*a. exactly one* real solution b. *exactly two* realsolutions c. *no real solutions*

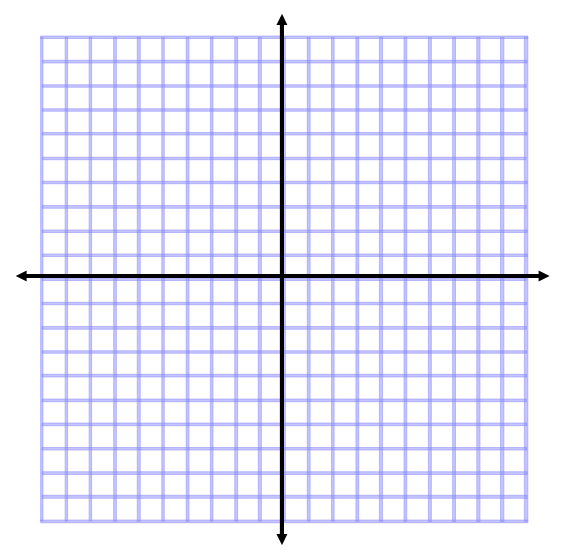
1. To find the y-intercept of any function, I just make x=\_\_\_\_\_\_\_\_\_\_.
2. You can use your graphing calculator to find the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a quadratic function.

**Practice:**

1. For the quadratic function shown in the graph, give the
   1. Vertex
   2. Axis of symmetry
   3. Y-intercept
   4. Solutions
2. Find the axis of symmetry and vertex for . Is the vertex a max or min?
3. Find the axis of symmetry and vertex for . Is the vertex a max or min?
4. Find the axis of symmetry and the y-intercept for .
5. Find the axis of symmetry and the y-intercept for 
6. Find the solutions of 
7. Find the solutions of 
8. Find the solutions of 
9. Find the solutions of 
10. Find the solutions of 



1. Write the equation of the given graph
2. Graph the function 



**Applications:**

1. An object in the air is given by the equation .
   1. Find the time when the object reaches its maximum height.
   2. Find the maximum height of the object.
   3. How high is the object after 1 second in the air?
   4. When will the object hit the ground?
2. You and a friend are hiking in the mountains. You want to climb to a ledge that is 20 ft above you. The height of the grappling hook you throw is given by the function What is the maximum height of the grappling hook? Can you throw it high enough to reach the ledge?
3. The total profit made by an engineering firm is given by the function Find the minimum profit made by the company.
4. A ball is thrown upward from a height of 15 feet with an initial upward velocity of 5 ft/s. Use the formula  to find how long it will take for the ball to hit the ground.